EXPLOMET 90
INTERNATIONAL CONFERENCE ON SHOCK-WAVE AND HIGH-STRAIN-RATE PHENOMENA IN MATERIALS

Marc A. Meyers, UCSD
Lawrence E. Murr, UTEP
Karl P. Staudhammer, LANL

January 10, 1992

U. S. ARMY RESEARCH OFFICE
Contract DAAL03-90-G-0068
University of California, San Diego
La Jolla, CA 92093-0411

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	January 10, 1992	

4. TITLE AND SUBTITLE
Support for Organizing and Hosting EXPLOMET 90: International Conference on Shock-Wave and High-Strain Rate Phenomena in Materials.

5. FUNDING NUMBERS

6. AUTHOR(S)
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L. E. Murr
K. P. Staudhammer

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Dept. of AMES
Mail Code R-011
University of California, San Diego
La Jolla, CA 92093-0411

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
U. S. Army Research Office
P. O. Box 12211
Research Triangle Park, NC 27709-2211

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES
The view, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other documentation.

12a. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited.

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

This report describes the major components and activities of EXPLOMET 90, an international conference on shock-wave and high-strain-rate effects held at UCSD August 12-17, 1990. The conference was attended by approximately 200 scientists and engineers from throughout the world and was enriched by invited/keynote lectures by a group of world-renowned scientists. Over 110 talks were presented and twenty posters were displayed. The proceedings are being published by M. Dekker and will appear in February 1992.

14. SUBJECT TERMS	15. NUMBER OF PAGES
	31
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT
UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED	UL

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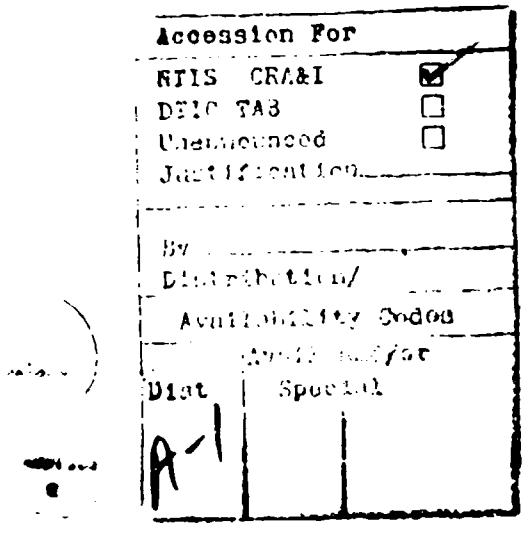

1. INTRODUCTION

The EXPLOMET 90 conference was a great success, as measured by the participation of approximately 200 scientists from over ten countries, by 120 presentations, and by the continuous interchange of ideas that took place. The sessions were devoted to the following topics; that also constitute special sections in the proceedings:

- High Strain Rate Deformation
- Shock and Combustion Synthesis
- Dynamic Consolidation
- Shaped Charge Phenomena
- Shear Localization
- Dynamic Fracture
- Shock Phenomena and Superconductivity
- Shock Waves and Shock Loading
- Shock and Dynamic Phenomena in Ceramics
- Explosive Welding and Metalworking

Two areas of research that did not receive attention at previous conferences were emphasized at EXPLOMET 90: these are shaped charges and shock phenomena in superconductivity. The successful evolution of EXPLOMET since the first conference can be gaged from the number of papers in the proceedings:

1980 Proceedings: 58 papers
1985 Proceedings: 63 papers
1990 Proceedings: 110 papers.

Concommitantly, the emphasis of the principal research thrusts has shifted throughout the years, and one could tentatively establish the following:

1970 - 1980 Explosive welding,forming, cladding, hardening
1980 - 1985 Shock compaction and synthesis; shock chemistry
1985 - 1990 Armor-anti-armor effects.

Chart 1 is an attempt to present the dynamic behavior of materials in the context of its contributing sciences and technological applications. These various contributions could be clearly seen at EXPLOMET. The mechanics, physics, and materials science components are essential in addressing more complex dynamic problems.

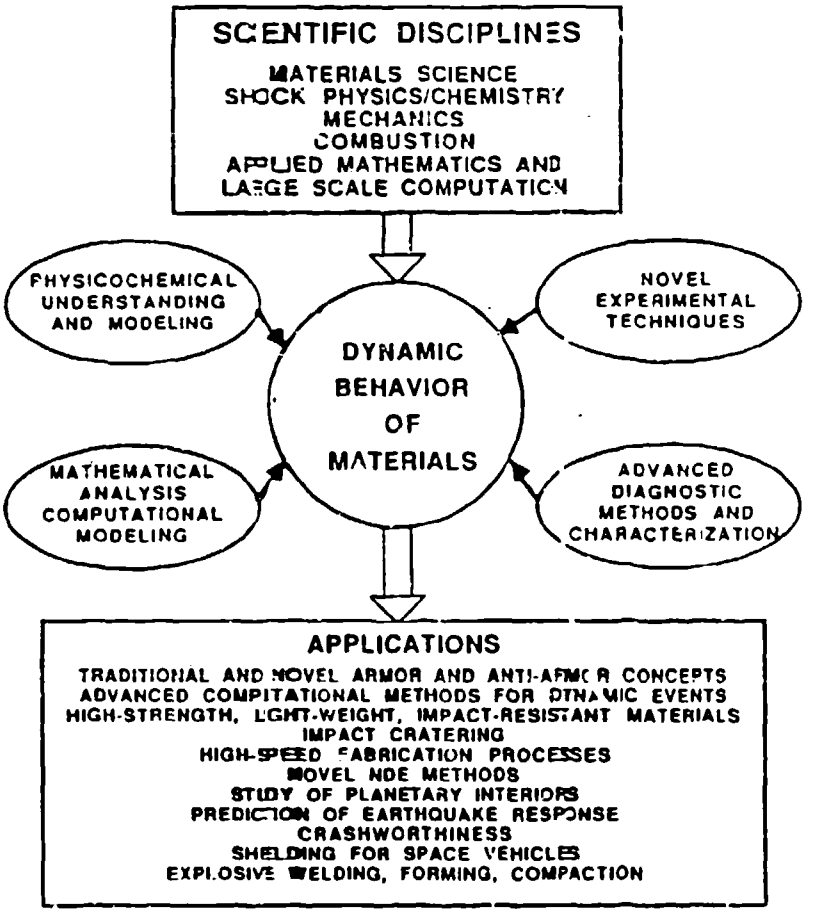

Chart 1. Contributory disciplines and applications of dynamic behavior of materials.

2. Program of Conference

The conference program was characterized by a good balance of papers of both experimental and analytical nature. Invited keynote talks were given by the following internationally renowned scientists:

T. J. Ahrens (California Institute of Technology)
Shock Compaction of Hard Materials

C. Y. Chiem (Ecole Nationale Superieure de Mécanique, France)
Material Deformation at High Strain Rates

B. Morosin (Sandia National Laboratories)
Shock Compression Processing

G. T. Gray III (Los Alamos National Laboratory)
Shock Experiments in Metals and Ceramics

J. Harding (University of Oxford, UK)
High-Strain-Rate Deformation of Composites

J. Ding (Beijing Institute of Technology)
Shock Processing in China

G. Mayer (IDA)
New Directions in Research on Dynamic Deformation of Materials

L. W. Meyer (IFAM, FR Germany)
Constitutive Models at High Strain Rates

M. A. Mogilevsky (Institute of Hydrodynamics, USSR)
Defect Generation in Shock-Wave Loading

W. Nellis (Lawrence Livermore National Laboratory)
Shock Compaction and Synthesis of High T_c Superconductors

S. Nemat-Nasser (University of California, San Diego)
Deformation and Fracture

V. F. Nesterenko (Sp. Design Office of High Rate Hydrodynamics, USSR)
Shock Consolidation and Synthesis of High T_c Superconductors

A. Sawaoka (Tokyo Institute of Technology, Japan)
Shock Compaction of Diamond

The program is given in the following pages.

Monday, August 13, 1990 8:30 a.m. - 9:00 a.m.

OPENING ADDRESS **Richard C. Atkinson**
Chancellor, University of California, San Diego

ORIENTATION **M. A. Meyers**

MONDAY, AUGUST 13, 1990 **I.** 9:00 a.m. - 12:00 p.m. Chairman: **L.E. Murr**
II. 1:30 p.m. - 5:00 p.m. Chairman: **Y.Remillieux**

PRICE CENTER THEATER

A,B.. HIGH STRAIN RATE DEFORMATION (I,II)

1. Invited Presentations

1. DYNAMIC DEFORMATION AND FRACTURE

   S. Nemat-Nasser, University of California, San Diego, La Jolla, CA

2. MECHANICAL BEHAVIOR OF COMPOSITE MATERIALS UNDER IMPACT LOADING

   J. Harding, Oxford University, ENGLAND

3. NEW DIRECTIONS IN RESEARCH ON DYNAMIC DEFORMATION OF MATERIALS

   G. Mayer, Institute for Defense Analyses, Alexandria, VA

4. CONSTITUTIVE MODELS AT HIGH STRAIN RATES

   L. W. Meyer, IFAM-Fraunhofer-Institut für angewandte Materialforschung, 28 Bremen, WEST GERMANY

5. MATERIAL DEFORMATION AT HIGH STRAIN RATES

   C. Y. Chiem, ENSM, Nantes, FRANCE

2. Contributed Presentations

6. MICROSTRUCTURE AND FRACTURE DURING HIGH-RATE FORMING OF IRON AND TANTALUM

   M. J. Worswick, Defence Research Esiablishment Suffield, Alberta
   N. Qiang, P. Niessen, and R. J. Pick, University of Waterloo, Ontario, CANADA

7. HIGH-VELOCITY TENSILE PROPERTIES OF Ti-15V-3Cr-3Al-3Sn ALLOYS

   N. Takeda, University of Tokyo, Meguro-ku, Tokyo
   A. Kobayashi, University of Tokyo, Bunkyo-ku, Tokyo, JAPAN

8. MECHANICAL BEHAVIOUR OF A HIGH STRENGTH AUSTENITIC STEEL UNDER DYNAMICAL BIAXIAL LOADING

   E. Staskewitsch, K. Stiebler,IFAM-Fraunhofer-Institut für Angewandte Materialforschung, Bremen, WEST GERMANY

9. MECHANICAL AND MICROSTRUCTURAL RESPONSE OF Ni$_3$Al AT HIGH STRAIN RATE AND ELEVATED TEMPERATURES

   H. W. Sizek and G. T. Gray III, Los Alamos National Laboratory, Los Alamos, NM

10. INFLUENCE OF MECHANICAL TWINNING ON THE DEFORMATION BEHAVIOUR OF ARMCO IRON

    B.-O. Reinders, E. Staskewitsch, IFAM-Fraunhofer-Institut für Angewandte Marterialforschung, Bremen, WEST GERMANY

11. THERMOELASTICAL MARTENSITIC TRANSFORMATION UNDER DYNAMIC STRESSES

    J. Muller, J. Condoure, J. F. Fries, Centre de Recherches Matériaux, Tarbes, FRANCE

12. MICROSTRUCTURAL DEPENDENCE OF HIGH STRAIN RATE DEFORMATION AND DAMAGE DEVELOPMENT IN TUNGSTEN HEAVY ALLOYS

    J. Lankford, C. E. Anderson, and H. Couque, Southwest Research Institute, San Antonio, TX

13. SHORT AND LONG TRANSIENTS IN DYNAMIC PLASTICITY OF METALS, MODELLING, AND EXPERIMENTAL FACTS

    J. R. Kepaczko, Université de Metz, Metz, FRANCE

14. DETERMINATION OF THE MATERIAL BEHAVIOUR OF STEEL 35NCD16 BY HOPKINSON-PRESSURE-BAR-TEST AND DYNAMIC TENSION-TEST
    CANCELLED
    K. Hoog, and E. Lach, French-German Reserach Institute of Saint-Louis (ISL) St. Louis, FRANCE

15. HIGH STRAIN RATE TITANIUM COMPRESSION: EXPERIMENTAL RESULTS AND MODELISATION

    S. Gabelotaud, C. Nguy, P. Bensussan, M. Berveiller*, and P. Lipinski*
    DGA/Centre de Rescherches et Etudes d'Arcueil, Arcueil, FRANCE
    * Laboratoire de Physique et de Mecanique des Matériaux, Metz, FRANCE

16. MODELLING OF FLOW STRESS AS A FUNCTION OF STRAIN RATE AND TEMPERATURE.

    F. Burgahn, O. Vöhringer, E. Macherauch, University of Karlsruhe, WEST GERMANY

17. A MODIFIED EXPERIMENTAL TECHNIQUE FOR DETERMINING THE DYNAMIC YIELD STRESS OF METALS BY USING FLAT ENDED PROJECTILES.

    H. I. Asim and S. A. L. Saiem, University of Baghdad, Baghdad, IRAQ.

18. DUCTILE FRACTURE OF CU - 1% PB AT HIGH STRAIN RATES

    C. Dumont and C Levaillant, CEMEF, Ecole des Mines de Paris, Sophia Antipolis, FRANCE

19. PLASTIC FLOW LOCALIZATION AT HIGH STRAIN RATES

D. Dudzinski, M. El Majdoubi, and A. Molinari, Laboratoire de Physique et Mecanique des Matériaux, Metz, FRANCE

20. THE DEFORMATION OF TUNGSTEN ALLOYS AT HIGH STRAIN RATES

R. Coates and K. T. Ramesh, The Johns Hopkins University, MD

21. TEXTURE-INDUCED ANISOTROPY AND HIGH-STRAIN-RATE DEFORMATION IN METALS

Sheila K. Schiferl and Paul J. Maudlin, Los Alamos National Laboratory, Los Alamos, NM 87545

22. SHOCK-WAVE DEFORMATION OF W-Ni-Fe HEAVE ALLOYS AT ELEVATED TEMPERATURES

A. Peikrishvili, L. Japaridze, G. Gotsiridze, and N. Chikhradze, Institute of Mining Mechanics, Tbilisi, USSR

EXPLOMET - 90

MONDAY, AUGUST 13, 1990 1:30 p.m. - 5:00 p.m. Chairman: S. Nemat-Nasser

PRICE CENTER BALLROOM B

C. SHOCK AND COMBUSTION SYNTHESIS

1. DIAMOND FORMATION IN NICKEL ALUMINIDES UNDER SHOCK WAVE LOADING

   I. Simonsen, S. Chevacharoenkul*, Y. Horie
   North Carolina State University, Raleigh, NC and *North Carolina Micro-electronics Center, RTP, NC.
   T. Akashi, Sumitomo Coal Mining Co., Akabira, JAPAN
   A. B. Sawaoka, Tokyo Institute of Technology, Yokohama, JAPAN

2. SHOCK INDUCED REACTIONS IN 1:1 ATOMIC PERCENT NICKEL/SILICON POWDER MIXTURES

   B. Krueger and T. Vreeland Jr., California Institute of Technology, Pasadena, CA

3. PRESSURE INCREASES DUE TO SHOCK-INDUCED REACTIONS IN POWDERS

   M. B. Boslough, Sandia National Laboratories, Albuquerque, New Mexico

4. COMBUSTION SYNTHESIS/DYNAMIC COMPACTION OF TITANIUM CARBIDE

   J. La Salvia, L. Meyer, A. Niiler, and M. A. Meyers, University of California, San Diego, La Jolla, CA

5. SHOCK-INDUCED CHEMICAL REACTIONS AND SYNTHESIS OF BINARY COMPOUNDS

   N. N. Thadhani, A. Advani, I. Song, E. Dunbar, and A. Grebe, New Mexico Tech, Socorro, NM and
   R. A. Graham, Sandia National Laboratories, Albuquerque, NM

6. DYNAMIC COMPACTION OF COMBUSTION SYNTHESIZED TIC-AL_2O_3 COMPOSITE

   Gary E. Korth, Richard L. Williamson, and Barry H. Rabin, EG&G Idaho, Idaho Falls, ID

7. EXPLOSIVE COMPACTION PROCESSING OF COMBUSTION SYNTHESIZED CERAMIC AND CERMETS

   A. Niiler, L. J. Kecskes, and T. Kottke, Ballistic Research Laboratory, Aberdeen Proving Ground, MD

8. SHOCK SYNTHESIS AND REACTION-ASSISTED CONSOLIDATION OF SILICIDES

   L. H. Yu and M. A. Meyers, University of California, San Diego, La Jolla, CA

9. MODELLING OF SHOCK-WAVE LOADING OF CHEMICALLY ACTIVE MEDIA

S. G. Psakhie, A. V. Astapenko, A. E. Kushnirenko, and S. I. Negreskul, The Institute for Strength Physics and Materials, Tomsk, USSR

10. SHOCK RECOVERY EXPERIMENT OF CARBONS

T. Sekine, National Institute for Research in Inorganic Materials, Tsukuba, Ibaraki 305, JAPAN (Present Address: Seismological Lab., California Inst. Tech., Pasadena, CA 91125.)

11. THE EXPLORATION OF CARBON PHASE GENERATED BY TNT/RDX DETONATION 60/40

A. L. Vereshchagin, P. M. Brylyakov, G. V. Sokovich, I. I. Zolotukhina, L. A. Petrova, and V. V. Novoselov, NPO "Altay", Byisk, USSR

TUESDAY, AUGUST 14 I - 8:30a.m. - 12:00 p.m. Chairman: A. Sawaoka
II -1:30 p.m. - 5:00 p.m. Chairman: A.A. Deribas

PRICE CENTER THEATER

D, E. DYNAMIC CONSOLIDATION (I,II)

1. Invited Presentations

1. SHOCK COMPRESSION PROCESSING IN JAPAN

   A. B. Sawaoka, Tokyo Institute of Technology, Midori, Yokohoma 227, JAPAN

2. DYNAMIC CONSOLIDATION OF DIAMOND

   T. J. Ahrens, California Institute of Technology, Pasadena, CA

2. Contributed Presentations

3. HOT CONSOLIDATION OF CERAMIC POWDERS AL_2O_3 AND SIC - INFLUENCE ON STRUCTURE

   R. Prümmer, H. Hirabayashi and A. Sawacka, Tokyo Institute of Technology,
   M. Yoshida, National Chemical Lab. for Industry, Tsukuba,
   Y. Yoshioka, Musashi Institute of Technology, Tokyo, and
   Y. Kimura, National Defence Academy, Yokosuka, JAPAN

4. SHOCK COMPACTION OF DIAMOND POWDER IN REACTIVE MIXTURES

   H. Kunishige, Y. Horie*, and A. B. Sawaoka, Tokyo Institute of Technology, Yokohama, JAPAN
   *North Carolina State University, Raleigh, NC

5. METHOD FOR DETERMINING PRESSURE REQUIRED FOR SHOCK COMPACTION OF POWDERS

   A. Ferreira, Instituto Militar de Engenharia, Rio de Janeiro, BRASIL
   M. A. Meyers, University of California, San Diego, La Jolla, CA

6. EFFECT OF INTERNAL GAS PRESSURE ON THE SHOCK CONSOLIDATION OF 304 STAINLESS STEEL

   N. E. Elliott and K. P. Staudhammer, Los Alamos National Laboratory, Los Alamos, NM

7. DYNAMIC CONSOLIDATION OF INTERMETALLICS

   M. S. Vassiliou, C. G. Rhodes, and M. R. Mitchell, Rockwell International Science Center, Thousand Oaks, CA

8. SHOCK DENSIFICATION/HOT ISOSTATIC PRESSING OF TITANIUM ALUMINIDE

   S. S. Shang and M. A. Meyers, University of California, San Diego, La Jolla, CA

9. COMPUTER SIMULATIONS OF LASER SHOCK COMPACTION OF POWDERS

   J.-P. Romain, D. Zagouri, L.E.D., ENSMA, Poiters, FRANCE

10. UNDERWATER-SHOCK CONSOLIDATION OF DIFFICULT-TO-CONSOLIDATE POWDERS

    A. Chiba, M. Fujita, M. Nishida, K. Imamura, and R. Tomoshige, Kumamoto University, Kumamoto, JAPAN

11. SEVERAL TECHNIQUES FOR ONE-DIMENSIONAL STRAIN SHOCK CONSOLIDATION OF MULTIPLE CAVITIES

    A. Mutz and T. Vreeland Jr., California Institute of Technology, Pasadena, CA

12. DYNAMIC COMPACTION OF COPPER POWDER: EXPERIMENTAL RESULTS AND 2D NUMERICAL SIMULATION

    T. Thomas*, P. Bensussan*, P. Chartagnac**, Y. Bienvenu***
    *DGA/Centre de Recherches et d'Etudes d'Arcueil, FRANCE
    **DGA/Centre d'Etudes de Gramat, Gramat, FRANCE
    Ecole Nationale Supérieure des Mines de Paris, FRANCE

13. MICROSTRUCTURE OF EXPLOSIVELY COMPACTED CERAMIC MATERIALS

    P. Boogerd and A. C. van der Steen, TNO Prins Mauritius Lab., THE NETHERLANDS

14. HOT SHOCK CONSOLIDATION OF DIAMOND AND CUBIC BORON NITRIDE POWDERS

    K. Hokamoto, S. S. Shang, and M. A. Meyers, University of California, San Diego, La Jolla, CA

15. IMPORTANCE OF PRE-HEATING IN DYNAMIC CONSOLIDATION OF SOME HARD MATERIALS

    L. Japaridze, A. Peikrishvili, N. Chikhradze, G. Gotsiridze, Institute of Mining Mechanics, Tbilisi, USSR

16. STRUCTURE AND PROPERTIES OF TIC-TINI SINTERED COMPOSITE OBTAINED UNDER SHOCK-WAVE EFFECT

    V. E. Panin, B. B. Ovechkin, A. I. Slosman, Tomsk Polytechnical Institute,USSR
    M. P. Bondar, N. A. Kostyukov, Lavrentyev Institute of Hydrodynamics,USSR

17. FORMATION OF NANOCRYSTALLINE STRUCTURE INDUCED BY SHOCK WAVE PROPAGATION IN AMORPHOUS MATERIALS

    S. G. Psakhie, S. Y. Korostelev, V. I. Vorbyov, and V. E. Panin, Institute for Strength Physics and Materials, Tomsk, USSR

18. EXPLOSIVE COMPACTION: MECHANISMS AND DEVELOPMENT CONCEPTIONS

    O. Roman, I. Pikus, A. Mirilenko, Byelorussian Powder Metallurgy Association, Minsk, USSR

19. SOME PROBLEMS FOR EXPLOSIVE CONSOLIDATION OF CERAMICS

Gao Juxian, Zhang Ke & Zhang Xiaohong, Institute of Mechanics, Academia Sinica, and Ai Baoren, Zhang Jinyuan, Zhu Ruizhen, Liu Chunlan, Iron and Steel Research Institute, Beijing, CHINA.

20. EQUATION OF STATE OF POROUS METALS IN EXPLOSIVE COMPACTION

Shao Binghuang, Xiaolin Wang, Liu Zhiyao, Institute of Mechanics, Academia Sinica, Beijing, CHINA

TUESDAY, AUGUST 14 1:30 - 5:00 p.m. Chairman: K. Iyer

PRICE CENTER BALLROOM B

F. SHAPED CHARGE PHENOMENA

1. Contributed Presentations

1. SHAPED CHARGE JETTING OF METALS AT VERY HIGH STRAIN RATES

   F. I. Grace, U.S. Army Ballistic Research Laboratory, Aberdeen Proving Ground, MD

2. HIGH STRAIN RATE DEFORMATION OF COPPER IN SHAPED CHARGE JETS

   Louis Zernow, Zernow Technical Services Inc., San Dimas, CA
   Lynn E. Lowry, Jet Propulsion Laboratory, Calif. Inst. of Tech., Pasadena, CA

3. PRELIMINARY STUDIES OF SHAPED CHARGE JET MICROSTRUCTURES

   A. Gurevitch, L. E. Murr, S. K. Varma, and S. Thiagarajah, University of Texas at El Paso, El Paso, TX

4. HIGH STRAIN, HIGH-STRAIN RATE DEFORMATION OF COPPER

   A. Chokshi, U. Andrade, and M. A. Meyers , University of California, San Diego, La Jolla, CA
   L.W. Meyer, IFAM, Bremen, WEST GERMANY
   J. Beatty, U.S. Army Materials Technology Laboratory, Watertown, MA

5. MATERIAL CHARACTERISTICS RELATED TO THE FRACTURE AND PARTICULATION OF ELECTRODEPOSITED-COPPER SHAPED CHARGE JETS

   D. H. Lassila, Lawrence Livermore National Laboratory, Livermore, CA

6. RHA PLATE PERFORATION BY A SHAPED-CHARGE JET: EXPERIMENT AND HYDROCODE SIMULATION

   M. N. Raftenberg and C. D. Krause, U. S. Army Ballistic Research Laboratory, Aberdeen Proving Ground, MD

8. ON THE RELATIONSHIP BETWEEN THE MICROSTRUCTURAL CONDITION OF THE LINER AND THE PERFORMANCE OF A SHAPED CHARGE

   C. S. da Costa Viana and C. N. Elias, Instituto Militar de Engenharia, Rio de Janeiro, RJ, BRASIL

9. TRANSFORMATION AND STRUCTURAL CHANGES IN METALS UNDER SHOCK AND DYNAMIC LOADING

   C. Feng, Development and Engineering Ctr, US Army Armament Research, Picatinny Arsenal, NJ

10. HIGH STRAIN RATE DEFORMATION BEHAVIOR OF SHOCKED COPPER

D. H. Lassila, Lawrence Livermore National Laboratory, Livermore, CA
G. T. Gray III, Los Alamos National Laboratory, Los Alamos, NM

11. CHARACTERIZATION OF COPPER SHAPED CHARGE LINER MATERIALS AT TENSILE STRAIN RATES OF 10^4 S^{-1}

W. H. Gourdin, Lawrence Livermore National Laboratory, Livermore, CA

WEDNESDAY, AUGUST 15 8:30 a.m. - 9:00 a.m. Chairman: J. Harding

PRICE CENTER THEATER

AWARDS CEREMONY

The John S. Rinehart Award is being established to reward outstanding scientific contributions and technological accomplishments in the field of dynamic processes in materials. The award will be given every five years at the occasion of the EXPLOMET Conferences. This award is named after Dr. J. S. Rinehart, a true pioneer in the field, and will be handed to two recipients (to be announced) by Dr. J. S. Rinehart. It consists of a silver medallion and a commemorative plaque.

WEDNESDAY, AUGUST 15 9:00 a.m. - 12:00 p.m.

PRICE CENTER THEATER

G. SHEAR LOCALIZATION

1. Invited Presentation

1. ADIABATIC SHEAR BANDS; SOME RECENT EXPERIMENTAL RESULTS
J. Duffy, Brown University, Providence, RI

2. Contributed Presentations

2. ON THE STABILITY OF THE UNIFORM SHEAR DEFORMATIONS: THE THERMAL I NSTABILITY AND THE DYNAMIC INSTABILITY

Claude Fressengeas and Alain Molinari, Laboratoire de Physique et Mécanique des Matériaux, Université de Metz, FRANCE

3. REVERSE-BALLISTIC IMPACT STUDY OF SHEAR PLUG FORMATION AND DISPLACEMENT IN Ti_6AL_4V ALLOY

W. H. Holt, W. Mock, Jr., W. G. Soper, and G. S Coffey, Naval Surface Weapons Center, Dahlgren, VA and Silver Spring, MD
V. Ramachandran and R. W. Armstrong, University of Maryland, MD

4. SURVEY OF ADIABATIC SHEAR PHENOMENON IN ARMOR STEELS WITH PERFORATION

Y. Meunier, R. Roux, J. Moureaud, Creusot-Loire Industrie, Le Creusot, FRANCE

5. A STUDY OF INITIATION MECHANISMS OF ADIABATIC SHEAR BANDS IN HIGH STRENGTH STEELS

   J. Beatty, Materials Technology Lab, Watertown, MA; L. W. Meyer, M. A. Meyers, and S. Nemat-Nasser, University of California, San Diego, La Jolla, CA

6. ACTIVATION ENERGY ASYMPTOTICS AND SHEAR BAND WITH FORMATIONS

   D. G. Lasseigne, Old Dominion University, Norfolk, VA

7. ADIABATIC SHEAR-BAND FORMATION IN EXPLOSIVES DUE TO IMPACT

   Pei Chi Chou, William Fliss, and Karen Konopatski, Dyna East Corporation, Philadelphia, PA

8. A DISLOCATION-MICROSCOPIC APPROACH TO SHEAR BAND FORMATION IN CRYSTALLINE SOLIDS DURING SHOCK OR IMPACT

   C. S. Coffey, Detonation Physics Branch (R-13), Naval Surface Warfare Center, White Oak Laboratory, Silver Spring, MD

9. A COMPARISON BETWEEN IGNITION IN A CONFINED THERMAL EXPLOSION AND ADIABATIC SHEAR BAND FORMATION

   T. J. Burns, National Institute of Standards and Technology, Gaithersburg, MD

10. MECHANICAL PROPERTIES IN SHEAR AT VERY HIGH STRAIN RATES OF AISI 316 STAINLESS STEEL AND OF A PURE IRON. COMPARISON WITH TENSILE PROPERTIES.

    C. Albertini, M. Montagnani, E. V. Pizzinato, A. Rodis, Commission of the European Communities, Joint Research Centre, Ispra Site, S Berlenghi, G. Pazienza, A. Paluffi, OTO Melara, Aulla, ITALY

11. LOCALIZATION MELTING DURING THE SEPARATION OF HIGH STRENGTH TENSILE SAMPLES

    D. D. Makel and H.G.F. Wilsdorf, University of Virginia,VA

WEDNESDAY, AUGUST 15 1:30 p.m.-5:00 p.m. Chairman: W. H. Gourdin

PRICE CENTER THEATER

H. DYNAMIC FRACTURE

1. FRAGMENTATION PROCESSES FOR HIGH-VELOCITY IMPACTS

   S. A. Finnegan and J. C. Schulz, Naval Weapons Center, China Lake, CA

2. NATURAL FRAGMENTATION OF EXPLODING CYLINDERS

   D. E. Grady and M. M. Hightower, Sandia National Laboratories, Albuquerque, NM

3. RATE-DEPENDENT MODELLING OF MULTIDIMENSIONAL IMPACT AND POST-SPALL BEHAVIOR

   J. A. Nemes, Naval Research Laboratory, Washington, D.C.
   J. Eftis, George Washington University, Washington, D.C.

4. SPALL OF DIFFERENTLY TREATED HIGH STRENGTH LOW ALLOY STEEL

   C. N. Elias, P. R. Rios, and A. W. Romero, Instituto Militar de Engenharia, Rio de Janeiro, BRASIL

5. SPALLING OF ALUMINUM AND COPPER TARGETS BY LASER-SHOCKS

   M. Boustie, and F. Cottet, ENSMA, Poitiers, FRANCE
   Y. Chauveau, S. A. MATRA, Velizy, FRANCE

6. ON ANOMALOUS INCREASE OF STEEL SPALL STRENGTH AND MARTENSITIC TRANSFORMATION INTERDEPENDENCE

   A. N. Dremin, A. M. Molodeo, A. T. Melkumov, and A. V. Kolesnikov, Institute of Chemical Physics, USSR Academy of Sciences, Chernogolovka, 142432, USSR

7. DEFORMATION AND FRACTURE BEHAVIOR OF 4340 STEEL UNDER SPALL LOADING CONDITIONS

   Anna K. Zurek, Los Alamos National Laboratory, Los Alamos, NM

8. DYNAMIC FRACTURE (SPALLING) OF SOME STRUCTURAL STEELS

   Jaroslav Buchar, Stanislav Rolc and Jiff Zeman, Institute of Physical Metallurgy, Brno, CZECHOSLOVAKIA

9. CORRELATION BETWEEN THE ULTIMATE ELONGATIONS OF RAPIDLY EXPANDING RINGS AND STRETCHING METAL JETS

   William H. Gourdin, Lawrence Livermore National Laboratory, Livermore, CA

10. THE DYNAMIC STRENGTH OF COPPER SINGLE CRYSTALS

G. I. Kanel, S. V. Rasorenov, and V. E. Fortov, Inst. for High Temperatures, USSR Acad. of Sciences, Moscow, USSR

11. COMPRESSION-INDUCED HIGH STRAIN RATE VOID COLLAPSE

S. N. Chang, and S. Nemat-Nasser, University of California, San Diego, La Jolla, CA

12. FRACTURE ALONG ADIABATIC SHEAR BANDS IN PLATES SUBJECTED TO PROJECTILE IMPACT

V. V. Astanin, Sh. U. Galiev, and K. B. Ivashchenko, Institute for Problems of Strength, Kiev, USSR

13. DO BRITTLE AND DUCTILE MATERIALS DIFFER AT SPALLING?

A. G. Ivanov, V. A. Ogorodnicov, All-Union Scientific Research Institute of Experimental Physics, Arzamas,USSR, 607200.

WEDNESDAY, AUGUST 15, 1990 1:30 - 5:00 p.m. Chairman: W. Nellis

PRICE CENTER BALLROOM B

I. SHOCK PHENOMENA AND SUPERCONDUCTIVITY

1. Invited Presentations

1. MAGNETIC AND ELECTRICAL PROPERTIES OF SHOCK COMPACTED HIGH-T_C SUPERCONDUCTORS

   W. J. Nellis and S. T. Weir, Lawrence Livermore National Lab., Livermore, CA
   M. B. Maple, C. L. Seaman, and E. A. Early, University of California, San Diego, La Jolla, CA
   M. J. Kramer, Ames Laboratory, Iowa State University, Ames, IA

2. SHOCK TREATMENT OF HIGH T_C CERAMICS

   V. F. Nesterenko, Lavrentiev Institute of Hydrodynamics, Novosibirsk, USSR

2. Contributed Presentations

3. ENHANCED CRITICAL CURRENTS AND FLUX PINNING IN SHOCK-WAVE PROCESSED BULK $YBa_2Cu_3O_{7-x}$ SUPERCONDUCTORS

   Z. Iqbal, Allied-Signal, Inc., Morristown, NJ, N. N. Thadhani, Research, New Mexico Tech., Socorro, NM, K.V. Rao, Royal Institute of Technology, Stockholm, SWEDEN, and B. L. Ramakrishna, Arizona State University, Tempe, AZ

4. LOW PEAK SHOCK PRESSURE EFFECTS ON SUPERCONDUCTIVITY IN $Bi_7Pb_3Sr_{10}Ca_{10}Cu_{15}O_x$

   M. A. Sriram, L. E. Murr, and C. S. Niou, The University of Texas at El Paso, El Paso, TX

5. THERMAL RECOVERY AND KINETIC STUDIES OF DEGRADED HIGH-T_C SUPERCONDUCTIVITY IN EXPLOSIVELY FABRICATED (SHOCK-LOADED) $YBa_2Cu_3O_7$, AND $Bi_7Pb_3Sr_{10}Ca_{10}Cu_{15}O_x$

   C. S. Niou, M. A. Sriram, R. Birudavolu, and L. E. Murr, The University of Texas at El Paso, El Paso, TX

6. MICROSTRUCTURAL MODIFICATIONS AND CRITICAL CURRENT DENSITIES OF EXPLOSIVELY COMPACTED OXIDE SUPERCONDUCTORS

   K. Takashima, H. Tonda, M. Nishida, Kumamoto University, Kumamoto
   S. Hagino, M. Suzuki and T. Takeshita,Central Research Institute, Mitsubishi Metal Corp., Saitama, JAPAN

7. STRUCTURAL CHANGES IN METALLIC AND SUPERCONDUCTING ($YBA_2CU_3O_7$) POWDERS INDUCED BY LASER DRIVEN SHOCKS

P. Darquey, J. C. Kieffer, J. Gauthier, H. Pépin, INRS-Energie, Varennes
B. Champagne, IGM, Boucherville
H. A. Baldis, D. Villeneuve, CNRC, Ottawa, CANADA

8. A COMPARISON OF RESIDUAL SUPERCONDUCTIVITY IN SHOCK PROCESSED, OXYGEN DEFICIENT, AND IRRADIATED Y-BA-CU-O

L. E. Murr, The University of Texas at El Paso, El Paso, TX

9. SUPERCONDUCTING PROPERTIES OF HIGH T_C SUPERCONDUCTORS SYNTHESIZED BY SHOCK-WAVE COMPACTION

C. Pclitis, I. Nuclear Solid State Physics, Karlsruhe, UCSD, La Jolla, CA
R. Prümmer, Ernst-Mach Institute, Freiburg, WEST GERMANY
W. Krauss, I. Nuclear Solid State Physics, Karlsruhe, WEST GERMANY
H. Keschtkar, HITEC Karlsruhe, WEST GERMANY

THURSDAY, AUGUST 16 8:00 a.m.- 12:30 p.m. Chairman: K.P.Staudhammer

PRICE CENTER BALLROOM B

J. SHOCK WAVES AND SHOCK LOADING

1. Invited Presentations

1. DEFECT NUCLEATION UNDER SHOCK LOADING

   M. P. Mogilevsky, Lavrentiev Institute of Hydrodynamics, Novosibirsk, USSR

2. SHOCK PROCESSING IN P. R. CHINA

   J. Ding, Beijing Institute of Technology, Beijing CHINA

3. SHOCK EXPERIMENTS IN METALS AND CERAMICS

   G. T. Gray, III, Los Alamos National Laboratory, Los Alamos, NM

2. Contributed Presentations

4. NOVEL APPLICATIONS OF SHOCK RECOVERY EXPERIMENTS

   L. E. Murr, The University of Texas at El Paso, El Paso, TX

5. DEFECT STRUCTURES OF SHOCKED TANTALUM

   Craig Wittman, Honeywell Inc., Hopkins, MN
   Robert Garret and James Clark, NSWC/White Oak,Silver Spring , MD

6. SHOCK CHARACTERIZATION OF EPOXY - 42 VOLUME PERCENT GLASS MICROBALLOONS

   L. J. Weirick, Sandia National Laboratories, Albuquerque, NM

7. QUASI-ISENTROPIC COMPRESSION TECHNIQUES FOR MATERIAL PROPERTY STUDIES

   L. C. Chhabildas, Sandia National Laboratories, Albuquerque, NM

8. ENERGETICS OF NANODEFECT STRUCTURES IN SHOCKED CRYSTALS

   F. A. Bandak, Naval Surface Warfare Center, White Oak Lab., Silver Spring, MD
   D. H. Tsai, (Ret.). Nat. Inst. of Standards and Tech., Gaith., MD
   R. W. Armstrong, University of Maryland, MD

9. MEASUREMENT OF RESIDUAL TEMPERATURES IN SHOCK LOADED CYLINDRICAL SAMPLES OF 304 STAINLESS STEEL

   K. P. Staudhammer, Los Alamos National Laboratory, Los Alamos, NM

10. PRESSURE-TEMPERATURE HISTORY OF THIN FILMS RECOVERED FROM MBAR SHOCK PRESSURES

    D. J. Benson, University of California, San Diego, La Jolla,CA
    W. J. Nellis, Lawrence Livermore National Laboratory, Livermore, CA

11. NUMERICAL SIMULATION OF A SAMPLE RECOVERY FIXTURE FOR HIGH VELOCITY IMPACT. STUDIES AT VARIOUS IMPACT VELOCITIES

    F. R. Norwood, Sandia National Laboratories, Albuquerque, NM

12. PHASE TRANSITION AND HUGONIOT DATA IN SHOCK-LOADED BISMUTH

    R. Dorneval, J. Perraud, C. Remiot, C.E.A. Courtry, FRANCE

13. RESIDUAL STRESSES INDUCED BY LASER-SHOCKS

    P. Ballard, J. Fournier, PSA Etudes and Recherches, Vélizy, FRANCE
    R. Fabbro,ETCA/CNRS Arcueil, FRANCE

14. THE STUDY ON FLYING ALTITUDE OF THIN FOIL UNDER GLANCING DETONATION OF EXPLOSIVE

    Zhang Kai, Research Institute of Engineering Mechanics, Dalian University of Technology, Dalian, CHINA.

15. ACCUMULATION OF MICRODAMAGES AT THE SHOCK LOADING OF IRRADIATED MATERIALS

    S. Yu. Korostelev, S. N. Berezin, W. N. Kirsanov, S. G. Psakhie, The Institute for Strength Physics and Materials, Siberian Branch, USSR Academy of Science, Tomsk, USSR

16. MODELLING OF THE ELASTIC PLASTIC DEFORMATION OF METALS BY SHOCK WAVES

    P. V. Makarov, USSR

THURSDAY AUGUST 16, 1990 1:30 p.m. - 5:30 p.m. Chairman: S.J.Bless

PRICE CENTER AUDITORIUM

K. SHOCK AND DYNAMIC PHENOMENA IN CERAMICS

1. Contributed Presentations

1. CRACK BEHAVIOR OF ALUMINA UNDER IMPACT LOADING

   H. Senf, H. Rothenhäusler
   Fraunhofer-Institut für Kurzzeitdynamik, Weil am Rheim
   S. Winkler,Fraunhofer-Institut für Werkstoffmechanik, Freiburg, WEST GERMANY

2. THE DYNAMIC RESPONSE OF AlN

   Z. Rosenberg, N. S. Brar, and S. J. Bless, University of Dayton Research Institute, Dayton, OH

3. RESPONSE OF ALUMINA TO SHOCK IMPACT

   Y. Wang and D. E. Mikkola, Michigan Technological University, Houghton, MI

4. DYNAMIC FRACTURE AND FAILURE MECHANISMS OF CERAMIC BARS

   N. S. Brar and S. J. Bless, University of Dayton Research Institute, Dayton, OH

5. BALLISTIC IMPACT BEHAVIOUR OF SIC REINFORCED ALUMINIUM ALLOY MATRIX COMPOSITES

   S. J. Bless, D. L. Jurick, University of Dayton Research Institute, Dayton, OH
   S. P. Timothy, Alcan International Ltd., Banbury, Oxon, ENGLAND

6. EXTENT OF DAMAGE INDUCED IN TITANIUM DIBORIDE UNDER SHOCK LOADING

   D. P. Dandekar and P. J. Gaeta, U. S. Army Materials Technology Laboratory, Watertown, MA

7. HIGH STRAIN RATE CHARACTERIZATION OF CERAMICS IN SHEAR

   A. Gilat and M. K. Chengalva, Ohio State University, Columbus, OH

8. A COMPUTATIONAL CONSTITUTIVE MODEL FOR BRITTLE MATERIALS SUBJECTED TO LARGE STRAINS, HIGH STRAIN RATES, AND HIGH PRESSURES

   G. R. Johnson and T. J. Holmquist, Honeywell Incorporated, Brooklyn Park, MN

9. PLANAR SHOCK AND PENETRATION RESPONSE OF CERAMICS

   M. E. Kipp, D. E. Grady, and J. L. Wise, Sandia National Laboratories, Albuquerque, NM

10. DYNAMIC TENSILE FRACTURE MECHANISM OF AIN CERAMICS

Y. Yeshurun, RAFAEL, Haifa, ISRAEL
D. G. Brandon, N. Lerner, Technion, Israel Institute of Technology, Haifa, ISRAEL
J. Duffy,Brown Univ., Providence, RI

11. HIGH-STRAIN-RATE COMPRESSION AND FRACTURE OF B_4C-ALUMINUM CERMETS

W. R. Blumenthal, Los Alamos National Laboratory, Los Alamos, NM

12. DYNAMIC RESPONSE OF MAGNESIA PARTIALLY STABILIZED ZIRCONIA

S. N. Chang, A. Nohara, W. P. Rogers* and S. Nemat-Nasser, University of California, San Diego, La Jolia, CA
*University of Colorado, Boulder, CO

13. FAILURE PHENOMENOLOGY OF CONFINED CERAMIC TARGETS AND IMPACING RODS

D.A. Shockey and A. H. Marchand, SRI International, Menlo Park, CA
S. R. Skaggs, G. E. Cort, M. W. Burkett and R. Parker, Los Alamos National Laboratory, Los Alamos, NM

THURSDAY, AUGUST 16 1:30 p.m. - 5:00 p.m. Chairman: R. Prümmer

RICE CENTER BALLROOM B

L. EXPLOSIVE WELDING AND METAL WORKING

1. Contributed Presentations

1. THE FACILITIES OF EXPLOSION LOCALIZATION (EXPLOSIVE CHAMBERS AND OTHER DEVICES)

   A. A. Deribas, Special Design Office of High Rate Hydrodynamics, Novosibirsk, USSR

2. IMPACT SPOT WELDING OF METALS BY SOFT PROJECTILE

   A. Turgutlu and S. T. S. Al-Hassani, Mech. Eng. Dept., UMIST, ENGLAND

3. EFFECT OF EXPERIMENTAL PARAMETERS ON THE SIZE OF WAVY INTERFACE IN MULTILAYER MATERIAL MADE BY SINGLE-SHOT EXPLOSIVE BONDING TECHNIQUE

   Kazuyuki Hokamoto, Masahiro Fujita, Akira Chiba, and Minoru Yamamori, Kumamoto University, Kumamoto, JAPAN

4. IMPACT STUD WELDING

   S. A. L. Salem and H. I. Asim, Mechanical Engineering Department, College of Engineering, University of Baghdad, Baghdad, IRAQ

5. LASER-DRIVEN MINIATURE PLATES FOR ONE-DIMENSIONAL IMPACTS AT 0.5 - ≥6.0 KM/S

   D. L. Paisley, Los Alamos National Laboratory, Los Alamos, NM

6. CLASSIFICATION, ESTIMATION AND INTERCONNECTION OF EXPLOSIVE WELDING MAIN PARAMETERS

   V. S. Sedykh, Polytechnical Institute, Volgograd, USSR

7. VIBRATIONAL MECANISM AT EXPLOSIVE WELDING

   N. Naumovich, T. Naumovich, Byelorussian P/M Association, Minsk, USSR

8. THE NUMERICAL SIMULATION OF SHOCK - WAVE PHENOMENA AT EXPLOSIVE WELDING

   V. Sazhin, G. Smirnov, Byelorussian P/M Association, Minsk, USSR

9. COMPUTER AIDED DESIGN SYSTEM OF EXPLOSIVE WELDING TECHNOLOGY OF LAYER COMPOSITE MATERIALS

   V. S. Sedykh, V. I. Lysak, S. V. Kuzmin, N. N. Zhdanova, S. I. Zhdanov, O. G. Kiryanov, Polytechnical Institute, Volgograd, USSR

MONDAY, AUGUST 13 - WEDNESDAY, AUGUST 15 AVAILABLE ALL DAY

PRICE CENTER THEATER LOBBY

M. POSTER SESSION

1. IMPACT BEHAVIOR OF CARBON FIBRE REINFORCED COMPOSITES UNDER BEND LOADING CONDITIONS

   F. J. Behler, E. Staskewitsch, IFAM-Fraunhofer-Institut für Angewandte Materialforschung, Bremen, WEST GERMANY

2. THE APPLICATION OF SHOCK WAVE FOCUSSING IN CONTROLLED FRACTURE

   S. J. Burley and S. T. S. Al-Hassani, Mech. Eng. Dept., UMIST, Manchester, ENGLAND

3. X-RAY PROFILE ANALYSIS ON HIGH STRAIN RATE DEFORMED STEELS

   F. Burgahn, O. Vöhringer, E. Macherauch, University of Karlsruhe, WEST GERMANY

4. MODELLING OF MULTIPLE COLLISION IN EXPLOSIVE WELDING THEORY AND EXPERIMENTS

   H. El-Sobky and S. T. S. Al-Hassani, Mech. Eng. Dept., UMIST, Manchester, ENGLAND

5. TEMPERATURE MEASUREMENT BEHIND THE PLANE SHOCK WAVE IN METAL

   S. N. Ishutkin, G. E. Kuzmin, V. V. Pai, Lavrentyev Institute of Hydrodynamics, Novosibirsk, USSR

6. A TECHNIQUE OF EXPLOSIVE WELDING OF ALUMINIUM ALLOY TO STAINLESS STEEL

   T. Izuma, T. Niwatsukino, Asahi Chemical Industry Co., LTD, Shiga, M. Fujita, M. Aoyagi, Kumamoto Univ., Kumamoto,JAPAN

7. SHOCK WAVE EFFECTS AND COMPACT STRUCTURE AT THE POWDER-RIGID OBSTACLE INTERFACE

   N. A. Kostyukov, Lavrentyev Institute of Hydrodynamics, Novosibirsk, USSR

8. THE INFLUENCE OF COMPONENT'S CONCENTRATION OF ALLOYS ON THEIR THERMODYNAMICAL PROPERTIES UNDER SHOCK-WAVE LOADING

   V. F. Lemberg, S. G. Psakhie, The Institute for Strength Physics and Materials, Tomsk, USSR

9. RESPONSE OF FILLED ELASTOMERS TO HIGH-STRAIN RATE LOADING

   A. J. Lindfors, Naval Weapons Center, China Lake, CA

10. DYNAMIC CHARACTERISATION OF MATERIALS USING A GUN AS TESTING MACHINE

    P. Montier, Etablissement D'Etudes et De Fabrications D'Armement De Bourges, FRANCE

11. DYNAMIC BEHAVIOUR OF BERYLLIUM

D. Montoya, G. Nauiin, J. P. Ansart, Centre d'Etudes de Bruyeres Le Chatel, 91680 Bruyeres Le Chatel, FRANCE.

12. NORMAL IMPACT OF RIGID CYLINDERS ON METAL PLATES

A. Neme*°, N. Dallian*, S. Fouquet°, E.N.S. de Cachan, °Etablissement Central de l'Armement,Arcueil,FRANCE

13. METAL SPALL STRENGTH AS A FUNCTION OF COMPRESSION SHOCK WAVE AMPLITUDE

V. A. Ogorodnikov, A. G. Ivanov, E. E. Tjunkin, V. A. Grigorev, A. A. Khokhlov, All-Union Scientific Research Institute of Experimental Physics, Arzamas, U.S.S.R.

14. INVESTIGATION ON THE DYNAMIC BEHAVIOR OF FOUR PURE IRONS

G. Pazienza, G. Pezzica, A. Paluffi, OTO Melara, Aulla, ITALY
C. Albertini, M. Montagnani, A. Rodis, Joint Research Centre - Ispra Establishment, Ispra, ITALY

15. MODELING THE THIN METALLIC PLATE RESPONSE IMPACTED BY SMALL PROJECTILE

L. Penazzi (1,2), N. Dahan (2), F. Tardival (1)
(1) E.T.C.A. - Centre de Recherches et d'Etudes d'Arcueil, Arcueil, FRANCE (2) E.N.S. Cachan, 94230 Cachan, FRANCE

16. AN APPROXIMATION OF THE PRESSURE PULSE OF A GRAZING DETONATION

E. Wlodarczyk, R. Trebinski, W. Trzcinski, Technical Military Academy, Warsaw, POLAND

17. PHASE AND STRUCTURAL CHANGE IN SHOCK COMPACTED CERAMIC POWDERS

V. N. Arisova, N. V. Oreshin, R. K. Tkachev, and A. F. Trudov, Polytechnic Institute, Volgograd, USSR

18. TARGET CONFIGURATIONS FOR PLATE IMPACT RECOVERY EXPERIMENTS

D.-T. Chung*, S. N. Chang, Y. F. Li and S. Nemat-Nasser, University of California, San Diego, La Jolla, CA
*Agency For Defence Development, Daejon, S. Korea

19. INFLUENCE OF ATMOSPHERE COMPOSITION ON THE STRUCTURE OF A Ti+Ti JOINT PRODUCED BY EXPLOSIVE WELDING

A. Berdychenko, L. Pervukhin, NPO Altai Scientific Research Institute of Mechanical Engineering, Barnaul, USSR

20. FORMING OF INTERMETALLIC PHASES IN Al+Ni+Al SYSTEM AFTER EXPLOSIVE WELDING AND HEAT TREATMENT

G. Popov, G. Vasyonysheva, V. Andrianov, NPO Altai Scientific Research Institute of Mechanical Engineering, Barnaul, USSR

21. THEORETICAL AND EXPERIMENTAL RESEARCHES OF RESIDUAL STRESSES AND DEFORMATION IN SHOCK-WELDED MULTILAYERED COMPOSITES

Ju. P. Trykov and E. P. Pokataev, Polytechnical Institute, Volgograd, USSR

22. NONISOTHERMAL INSTABILITY AND STRAIN RATE ELASTOPLASTIC DEFORMATION LOCALIZATION

    V. M. Volchkov, A. A. Kozlov, P. V. Kuzin, Volgograd Politechnical Institute, Volgograd, USSR

23. THE EFFECT OF POROUS LAYERS ON EXPLOSIVE HARDENING OF METALS

    A. A. Deribas, A. A. Shtertser, and I. N. Gavrilyev, Special Design Office of High Rate Hydrodynamics, Novosibirsk, USSR

24. ELECTRIC PROPERTIES OF DISORDERED COMPOSITE ELECTRIC-METAL OBTAINED BY EXPLOSION

    A. I. Matitsin, A. A. Deribas, Special Design Office of High Rate Hydrodynamics, Novosibirsk, USSR

25. HIGH-VELOCITY PLASTIC DEFORMATION IN BIMETAL DURING EXPLOSION WELDING

    V. N. Gulbin, V. A. Khripunov, Y. V. Alexandrov, K. K. Krasikov, V. B. Voinov

26. THE MECHANICS OF SPOT WELDING BY HIGH SPEED WATER JET

    S. A. Salem, Dept. of Mech. Eng., College of Engineering, University of Baghdad, IRAQ
    S. T. S. Al-Hassani, Dept. of Mech. Eng., UMIST, ENGLAND

27. STRUCTURE CHANGES IN THE AMORPHOUS METALLIC ALLOYS UNDER THE SHOCK-WAVE LOADING

    A. Z. Bogunov, V. I. Kirko, A. A. Kuzovnikov, L. V. Kirensky Institute of Physics, Krasnoyarsk State University, U.S.S.R

28. FLOW FIELDS IN POROUS SAMPLES UNDER GLANCING DETONATION

    C. M. Cheng, Shao Binghauang, Xiaolin Wang, Institute of Mechanics, Academia Sinica, Beijing, CHINA

29. THEORETICAL CALCULATION OF HUGONIOT CURVES FOR REACTIVE MATERIALS

    F. Bugaut, Commissariat à l'énergie, Courtry, FRANCE

30. MAGNETIC IMPULSIVE ASSEMBLING OF PIPES FROM FIBROUS COMPOSITE MATERIALS WITH METALLIC TIPS

    V.A. Gluschenkov, B.A. Scheglov, U.A. Moskalev, V.I. Pesotzkij, U.S.S.R.

31. ADIABATIC SHEAR AND LOCALIZATION OF DEFORMATION DURING HIGH-SPEED PROCESSES OF METAL CUTTING

    A.A. Kozlov, V. A. Nosenko, A. P. Tatarinov, U.S.S.R.

3. Award

An award was established to provide an incentive for excellence in the field of dynamic behavior of materials. This award was named after John S. Rinehart. John S. Rinehart personally oversaw the production of the medallions and plaques. It is hoped that this award will set standards for excellence in the field of dynamic behavior of materials by motivating younger investigators to emulate the accomplishments of the recipients.

This award was established to recognize outstanding effort and creative work in the science and technology of dynamic processes in materials. This encompasses the processes by which materials are welded, formed, compacted, and synthesized, as well as dynamic deformation, fracture, and the extreme shock loading effects. The award is named after a true pioneer, who witnessed and actively contributed to the field for over forty years.

This award will be given every five years, at the occasion of the EXPLOMET conferences. The selection of the first two awards was made by a committee composed of the EXPLOMET chairman and of Dr. J. S. Rinehard. For subsequent years, the awardees will chair the committee for future awards. A permanent committee is in such a way established to select the nominees. In selecting the individuals, special attention will be given to the balance between fundamental science and technological implementation.

John S. Rinehart has not only witnessed, but actively took part in the development of the field of dynamic deformation over the past forty years. A true pioneer, he has dedicated his life to the study of stress waves in solids; the results of these investigations have been published in over 130 technical articles and three books, two of them co-authored by John Pearson. *Behavior of Metals Under Impulsive Loads*, *Explosive Working of Metals* and *Stress Transients in Solids*, have been the *vade-mecum* of all scientists and engineers throughout the world working in the field. The simple, no-nonsense, yet fundamentally correct approach used by Dr. Rinehart combines the rigorousness of the physicist with the practicality of the engineer. His 50-year career has been divided between government and university, and he has frequentiy served as a consultant to industry. He has occupied many positions of high responsibility throughout his career: Director of Research and Development for the U. S. Coast and Geodetic Survey, Director of the Mining Research Laboratory of the Colorado School of Mines, which he founded, Assistant Director of the Smithsonian Astrophysical Observatory, Head of the Mechanics Branch at the Naval Ordnance Test Station, China Lake, Professor of Mechanical Engineering at the University of

Colcrado. Dr. Rinehart was associated with Dr. E. J. Workman's Ordnance Research Group before this activity became a division of the New Mexico Institute of Mining and Technology in the early 1950's.

The recipients for the 1990 John S. Rinehart award were Andrey A. Deribas (USSR) and Mark L. Wilkins (LLNL-USA). The inscriptions on the plaques read:

Andrey A. Deribas, co-recipient of the 1990 John S. Rinehart Award for seminal contributions to the theory of explosive welding, for the first experiments of shock synthesis and for leadership in the technological implementation of explosive fabrication.

Mark L. Wilkins, co-recipient of the 1990 John S. Rinehart Award for seminal contributions to the development of hydrocodes, for their application to a multitude of dynamic problems and for leadership in the technological implementation of shock compaction.

4. Proceedings

The proceedings of the conference are being published by Marcel Dekker as a 1,200-page volume entitled: *Shock-Wave and High-Strain-Rate Phencmena in Materials*, and edited by the co-chairmen of the conference. The papers required extensive editing and this resulted in production delays. Nevertheless, the book will be ready in April 1992. It will be distributed to the participants and three volumes will be sent to the Army Research Office.

5. Participant Response

A questionnaire was send out to the EXPLOMET participants, in order to establish the response of the participants and the modifications in organization required. The tabulated response from the questionnaire is given on the next page. Approximately 75 participants responded. Not all the questions were answered on each reply. The results of questions 1-3 are on the next page. The responses to questions 4 and 5 are listed separately below.

Question 4) With the increased participation, several options can be implemented regarding the presentations:

Responses

12 Simultaneous sessions - no posters
3 Simultaneous sessions - with posters
16 Plenary lectures + posters
30 Plenary lectures in morning with shorter talks in afternoons - no posters
4 Plenary lectures in morning with shorter talks in afternoons - with posters
2 Same as EXPLOMET 90

Question 5) My suggestions for future conferences are:

Proceedings given out at start of meeting
Better reception
Ample parking
Limit the time for papers
Poster session was poor
Earlier meeting notification
Smaller room, auditorium was too big the size of the of the session
Exhibits/Journals, etc., with ordering information
Posters and conference room adjacent to each other for better access
Add panel discussions
Better transportation into town
More general plenary lectures
More discussion time
Too big, limit the number of talks/focus them
Better hosting of foreign visitors not familiar with the area/language
Better directions on/for social programs
Keep up the good work
More application papers
Start with plenary lectures
Restrict the number of papers
Language proficiencies of some of the (foreign) authors
Doing a very good job
One day - AM + Evening/Afternoon free
Plenary 15-20%, parallel 60-70%, poster 15-20%, mornings + afternoon
~100% over 5 days

Question 1) The technical program of EXPLOMET was:

38 - excellent; 35 - very good; 10 - good; 1 - poor.

Question 2) The accomodations were:

19 - excellent; 26 - very good; 29 - good; 4 - poor.

Question 3) The social program of EXPLOMET was:

17 - excellent; 34 - very good; 19 - good; 3 - poor.

6. Future EXPLOMETS

The success of EXPLOMET 80, 85, and 90 fully warrants the continuation of this conference series. This quinquennial frequency is well suited for a realistic appraisal of progress in the field. The organizers of EXPLOMET 90 are hopeful that the U. S. Army Research Office will continue to support future conferences. The Army support was essential in bringing invited speakers of international reputation and for providing services necessary for the success of the conference.